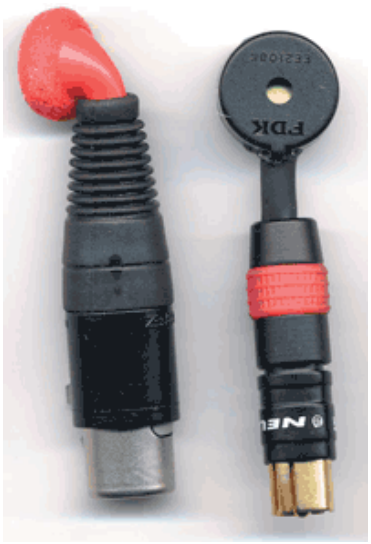
Test the polarity of your mics

The relative polarity test of your mikes is very useful to know when recording or amplifying sound with a lot of mikes. A combination of the NTI audio generator Minirator MR 1, the audio analyzer ML1 and a do-it-yourself adapter will be able to give you the answer to one of your questions. Is it the right polarity?

Preparing the test

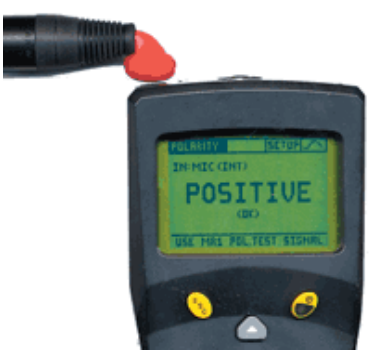


Picture of an adapter

In this test, we need to convert the electric generator Minirator MR1 in an acoustic generator. The output level and impedance allow direct drive of a transducer.

We tested two kinds of transducers. The first is a 16 to 25 mm diameter piezoelectric buzzer and the second one a miniature headphone (Walkman) transducer.

Piezo buzzers have capacitive impedance perfectly accepted by the MR1 output circuit. . Headphone drivers have around 30 ohms impedance and the output circuit of the MR 1 is able to drive them.



The test with the adapter and the internal ML1 microphone.

The transducer polarity will be chosen in the following way. First, you choose „Polarity“ mode for the ML1. If you place the transducer in front of the ML1 mike input, the screen must display „POSITIVE“ (OK).

The microphone under test will be connected to the ML1 with a 20 to 40 dB preamp. The necessary gain depends on the microphone sensitivity and the efficiency of the combination of the MR1 and the transducer.

Measurements

Minirator MR1: Choose the “Pol test” signal and the maximum output level. (1,25 V or +4 dBu)

Select „Unit: V“ or „Unit : dBu“ in the Setup menu of the MR1.

Minilyzer ML1: Use “Polarity” function, the microphone polarity relative to the internal mike of the ML1 will be displayed directly on the Minilyzer screen: “POSITIVE” (OK) or “NEGATIVE” (REVERSE).

Test of a sound system:
To test the polarity of all the microphones connected to a mixing desk, the ML1 is connected to one of the outputs of the console (available on stage if necessary). The MR1 and its adapter will then be successively placed in front of all the concerned microphones. This test will show the microphone polarity, the cable problems and a wrong polarity switch position.
Wireless microphones will be tested with the same procedure.

Measurement principle

The MR 1 generates an asymmetrical electrical signal allowing the detection of a signal phase. The adapter converts the electric signal in an acoustic wave going into the under test mike. The ML1 analyses the signal coming from the microphone by four ways and if the result is consistent, displays its polarity.

When we are in the acoustic domain, the importance of the phase becomes relative. A PA system can work without any problem in or out of phase. What is important is the relative respect of the relative phase of different microphones capturing the same sound source. With opposite phase, we can have many cancellations.

In this application, we can also test the absolute phase if you consider that the ML1 gives the absolute reference.

Text and application idea of Mr. Etienne Lemery. Many thanks!

Thomas Hupp / NTI AG